Department of Budget & Management

INFORMATION TECHNOLOGY PROJECT OVERSIGHT

DECEMBER 31, 2004

As Requested by the 2004 Joint Chairmen's Report

Executive Summary

The 2004 Joint Chairmen's Report (JCR) directed the Department of Budget & Management (DBM) to provide a blueprint for future information technology (IT) project oversight and how the blueprint is to be implemented. This report is in response to that direction.

Information Technology (IT) project management is widely recognized as an extensively risky undertaking. There is however, general agreement that most IT project failures are not caused by technology. Typically, project failures occur as a result of a combination of human factors such as a lack of executive support, inconsistent funding, exclusion of system users in the design phase, unwillingness to modify business practices and an internally focused project team.

The Department of Budget and Management's strategy for IT project management oversight consists of the following fundamental components:

- ***System Development Life Cycle (SDLC)***. All major IT projects are required to follow the SDLC process. The SDLC is an existing series of IT project management processes governing the development and execution of IT projects. Each of the ten SDLC phases requires specific project milestones and deliverables be developed, followed and managed. It is against these milestones and deliverables that initial project approval is authorized and continued project performance is assessed.

- ***Project Funding Approval.*** The initial and continued funding of a major IT project begins with the agency's annual submittal of an Information Technology Project Request (ITPR). DBM reviews each request for consistency with IT standards, policies and guidelines, support of statewide and agency business objectives, and the presence of sound and secure IT infrastructure plans and strategies. The ITPR is also evaluated in the context of the overall agency budget submission. For established projects, DBM considers past project assessments and the current status and performance of the project. Projects receiving appropriated funds must be established in the statewide accounting system (R*STARS) in accordance with published standards.

- ***Peer Review***. A panel of Chief Information Officers from State agencies that have demonstrated strong project management practices and project success will assess project performance and make recommendations to mitigate project risk. Peer review will be used as necessary depending on risk and size of project.

- ***Independent Verification and Validation (IV&V)***. An IV&V may be utilized whenever deemed necessary by the agency or State CIO to satisfy stakeholder concerns, when a significant project milestone has been achieved or has not been achieved, or when a project exhibits a significant increase in risk. Multiple

IV&V's may be performed throughout the life cycle of a project if the State CIO determines a project is at risk of under performing.

- ***Variable Centralized Project Management***. Agencies will continue to have the initial and primary responsibility to successfully develop and manage IT projects. To monitor and supplement project performance when required, DBM intends to add three professional project management staff. These positions will have the responsibility of closely monitoring project status through the various methods described in this report. In situations where a project is considered to be significantly at risk, DBM may assign staff full time to a project until the issues have been resolved and the project is no longer at risk. If the level of project oversight needs to expand temporarily, skilled contract personnel would be engaged.

- ***Funding.*** Once project funds are appropriated, the State CIO may approve funding incrementally, consistent with the systems development life cycle plan. Should situations occur when project risk mitigation strategies have not succeeded in preventing or correcting project deficiencies, the State CIO will suspend funding pursuant to State Finance and Procurement Article 3-410.1 and through the Major Information Technology Development Project Fund (MITDPF) until remedies have been identified and implemented. For those projects not funded through the MITDPF, the State CIO will request the DBM Secretary to exercise existing budget controls to suspend funding until such remedies have been identified and implemented.

In conclusion, existing processes have been and will continue to be refined, new processes are being established and effective project oversight will be appropriately scaled relative to the characteristics of each specific project.

A flow chart summarizing these processes, interdependencies and project relationships is included as Attachment A.

Introduction

This report establishes the blueprint for oversight of future major information technology (IT) projects. The blueprint defines the methodologies to assess adherence to established project management processes, the application of project management best practices, and to gauge the overall effectiveness of the project management team. Project management best practices include: executive sponsorship, end user involvement, well-defined functional requirements, defined delivery schedules, accurate cost projections, and effectively managing project scope changes.

This blueprint is based on the philosophy that successful projects are not a result of oversight but are a result of a culture of adherence to established processes proven to result in successful project outcomes. The role of oversight is to ensure that established processes are being properly implemented and adhered to, and when deviation occurs, corrective actions are implemented prior to the occurrence of significant project impact. The blueprint provides a flexible process that establishes an appropriate level of oversight based on project risk and project team performance.

The State's existing System Development Life Cycle (SDLC) provides a proven methodology that results in the implementation of safe, secure, and reliable IT systems. It does so by requiring project managers to adhere to a framework that governs how a system is managed from concept through retirement. The SDLC facilitates a process of identifying and quantifying project risk, establishing risk mitigation strategies and then monitoring for the realization of the risk. Projects exhibiting a high-risk profile require a higher degree of oversight compared to projects having a low-risk profile.

While the discussion of project management and oversight is focused primarily on Major IT projects, the methodologies presented are flexible and can be applied to projects of lesser scope or magnitude.

Project Oversight

There is general agreement among industry experts that most information technology (IT) project failures occur not as a result of the technology being implemented, but as a result of a combination of human factors such as a lack of executive support, inconsistent funding, exclusion of system users in the design phase, an unwillingness to modify business practices and an internally focused project team.

Project success typically occurs when people, qualified and experienced in the technologies being deployed and in the business environment in which the resulting system is to benefit, are given the responsibility, the authority, the resources and the tools necessary to succeed. In addition, successful projects possess similar characteristics:

- Executive sponsorship is present throughout the life of the project.
- The appropriate level of responsibility, authority and resources are assigned to the project.
- Effective management of project resources is present.
- Prescribed processes and methodologies consisting of best practices for project execution are employed that govern the effective structuring and management of project resources.
- The project team adheres to prescribed processes and methodologies.
- The functional users of the resulting system are involved throughout the project.
- Effective project oversight is utilized to identify and adjust for increased project risk.

Failed projects are usually a result of one or more of the key characteristics having a limited effect or are nonexistent during the life of the project. When executive sponsorship is weak or agnostic, when business process owners have a limited role, or when project responsibilities are delegated to under qualified project managers and team members, the risk to the project is significantly increased.

The intent of project oversight is to reveal as early as possible changes in a project's risk profile that may result from an ever-changing business environment, or deviations from the project's approved implementation plan or resource allocation. Effective project oversight must provide an objective assessment of the project team's effectiveness in managing assigned resources and adherence to established processes proven to result in project success. Effective project oversight should:

- Manage project risk through a project governance structure that frequently evaluates performance throughout the life of the project.
- Validate and frequently reconfirm the concept, scope and requirements of the project.
- Evaluate a project team's performance using a prescribed set of checks and balances integral to established processes such as strategic planning, investment management, funding and project execution.

- Assist in achieving the ultimate goal of successful IT projects.
- Create a flexible project culture to accommodate unique project requirements and business environments.
- Be accountable to every stakeholder organization responsible for project success.

The effectiveness of project oversight is significantly reduced when oversight falls solely to a centralized organization periodically engaged to validate the level of compliance to an approved methodology. Effective project oversight occurs when a balance is struck between continuous assessment by the organization executing the project, and periodic validation by external stakeholder organizations. Furthermore, effective project oversight cannot be layered on top of the existing processes that govern the life of a project, but must be an integral component of these processes.

System Development Life Cycle

The State's System Development Life Cycle (SDLC) is the core foundation for successfully implementing IT projects[1]. The purpose of the SDLC is to provide project managers with a set of tools to define and manage the implementation of IT systems. The goals of the SDLC are to:

- Deliver quality systems that meet customer functional requirements, expected project completion schedules and cost estimates.
- Provide a framework for developing quality systems using an identifiable, measurable, and repeatable process.
- Establish a project management structure to ensure that each system development project is effectively managed throughout its life cycle.
- Identify and assign roles and responsibilities to all involved parties, including executive sponsors, functional and technical managers, and anticipated system users throughout the system development life cycle.
- Ensure that system development requirements are well defined and subsequently satisfied.

The SDLC methodology assists in achieving these goals by:

- Establishing appropriate levels of management authority to provide timely direction, coordination, control, review, and approval of the system development project.
- Ensuring project management accountability.
- Documenting requirements and maintaining traceability of those requirements throughout the development and implementation process.

[1] The complete System Development Life Cycle, Volumes 1 – 4 can be found at www.dbm.maryland.gov, Keyword: SDLC

- Ensuring that projects are developed within the current and planned information technology infrastructure and to established standards, policies and guidelines.
- Continuously identifying and monitoring project risks and risk mitigation strategies.

Conformance to the SDLC is crucial for project success. Throughout a project's life cycle, DBM regularly reviews agency compliance with the SDLC at defined intervals and at prescribed project milestones. Attachment A provides an overview of the alignment of the SDLC to the oversight requirements of a typical major IT project.

While the methodology and tools provided in the SDLC are very effective, projects must also align with other strategic planning and budgeting processes. These include Managing for Results, Statewide and agency Information Technology Master Plans and Information Technology Project Requests. Throughout the life of a project, DBM regularly validates agency compliance to each of these processes. Reviews are performed to ensure consistency with Statewide IT direction, IT standards, policies and guidelines, support of statewide and agency business objectives, and the presence of sound and secure IT infrastructure plans and strategies. These include:

- State Information Technology Master Plan (ITMP). The State's ITMP defines State level strategic initiatives relating to information technology[2]. Proposed projects must align with these strategic initiatives.
- Managing For Results (MFR). MFR facilitates the strategic planning process for agency business goals and objectives. Proposed projects must support the agency's strategic business plan.
- Agency ITMP. Establishes the agency's information technology goals necessary to meet the agency's mission requirements and the business initiatives identified in the agency's MFR documents. Serves to communicate the technical justification for IT operating and major IT development project funding.
- Information Technology Project Requests (ITPR). A standardized approach for agencies to request funding for major IT projects. Following the completion of the Concept Phase of the SDLC, the agency must submit an Information Technology Project Request (ITPR) to DBM in accordance with published standards. DBM reviews each request for consistency with IT standards, policies and guidelines, support of statewide and agency business objectives, and the presence of sound and secure IT infrastructure plans and strategies. DBM considers each ITPR in the context of the overall agency budget submission. Sound projects are recommended to receive an allowance from the Governor (consistent with current guidelines). Projects receiving appropriated funds must be established in the Statewide accounting system

[2] The FY2006 State of Maryland Information Technology Master Plan can be found at www.dbm.maryland.gov, Keyword: State ITMP

(R*STARS) in accordance with published standards. Financial tracking and reporting on these projects is produced from the R*STARS system.

Assessing Project Performance

The processes mandated by the SDLC result in critical project characteristics being defined, documented and finalized. These characteristics establish the baseline for assessing project performance towards the realization of expected project outcomes. It is the responsibility of both the project's sponsoring agency and DBM to assess project performance against these expectations.

One such key characteristic is the project's risk profile. In accordance with the SLDC, upon development of the project's concept proposal, the project's sponsoring agency makes a determination whether or not the project continues to make strategic sense. If so, the project manager must complete a Risk Management Plan to further assess the feasibility of the proposed project. The Risk Management Plan identifies potential project risks, establishes a probability of risk realization, and documents a mitigation strategy for each of the identified risks.

Once the Risk Management Plan is completed, DBM reviews the project in terms of the project's business case, the Risk Management Plan and the proposed methodology for acquiring and implementing the proposed solution. The project's Risk Management Plan must be approved by DBM prior to the agency proceeding with the Planning Phase of the SDLC.

By utilizing the Risk Management Plan required by the SDLC, a flexible, multilayered assessment strategy can be defined and tailored to accommodate major IT projects of varying degrees of complexity and risk. Projects that possess high-risk characteristics - those that consist of a one of a kind or highly customized system, have significant public impact related to the success or failure of the project, or have a significant project cost distributed over a number of years before project benefits can be realized - would require substantially more oversight than those projects characterized as low risk.

DBM will establish a project assessment schedule consistent with the project's risk profile as part of approving the project's Risk Management Plan. The project assessment schedule will detail the appropriate level of oversight; define specific project risks/characteristics to be assessed; and the frequency of each assessment. The project assessment schedule will be based on a multilayered approach to project oversight. Each layer of oversight will have a cumulative effect resulting in a comprehensive, objective assessment of the project team's effectiveness in managing assigned resources, adherence to established project management processes, and progress towards achieving project objectives. Multilayered oversight will consist of four layers: Sponsoring Agency, DBM, Peer Review, and Independent Verification and Validation.

Sponsoring Agency Responsibility

Recognizing that the project's sponsoring agency has responsibility for accurately defining and effectively executing the project, constant monitoring by the agency throughout the life of the project is mandatory. In addition to evaluating milestones defined as project deliverables or as outcomes of an SDLC phase, the agency must continuously assess how well available resources are being employed, how well functional requirements are being satisfied and how well project risks are being mitigated. The responsibility for the day-to-day assessment of the project falls to the agency in general and specifically to the project manager.

To validate that the project manager is performing effectively, it is necessary for the agency to establish an internal oversight process consistent with the project's assessment schedule defined by DBM. The project's executive sponsor is responsible for ensuring agency internal oversight is conducted. While typically not an IT professional experienced in project management, the executive sponsor is the individual who has determined that the project is important to the agency's business goals and has the authority to direct agency resources to produce the expected results of the project. Assisting the executive sponsor should be a project steering team consisting of project stakeholders tasked with challenging the project team to demonstrate that the project is progressing as planned.

This layer of assessment will be employed for all major IT projects regardless of a project's profile. It will be a structured assessment performed by internal agency staff aimed at requiring the project manager to respond to the project's Executive Sponsor's need to validate that the project is progressing as planned. The project will be assessed in terms of schedule, planned versus budgeted expenses, cost projections, end user feedback, and a review and validation of the risk management plan.

DBM Responsibility

The second layer of project oversight is the responsibility of DBM. The State Chief Information Officer (CIO) has responsibility for all major IT projects.

Validation of the project by DBM begins in the concept phase of the SDLC and continues until completion. Throughout the life of the project, DBM will review project milestones and deliverables for compliance and consistency with established processes, polices and procedures; assess the project for compliance with project specific requirements; and make recommendations designed to influence project success. DBM will review, approve and monitor:

- Project business case and overall project strategy. Regardless of how well a project is managed, if the project is fundamentally flawed based on incorrect assumptions, failing to assess potential alternatives, or ignoring established standards and policies, it will fail. Prior to approving the agency's

Information Technology Project Request (ITPR) DBM will have approved the business case and validated the approach to identify, acquire and implement the proposed solution.

- Project Risk Management Plan. During the concept phase of the SDLC, DBM will evaluate the project's risks and associated risk mitigation strategies. Based on the project's risk profile, DBM will establish a project assessment schedule to be followed throughout the remainder of the project. The project assessment schedule will be aligned with critical project milestones and detail the appropriate level and frequency of oversight. All projects will be assessed at the requirements analysis phase and the implementation phase. For the design, development, implementation and test phases, DBM will determine the appropriate project assessment strategy.
- Compliance with established project assessment schedule. DBM will validate that the project assessment schedule is being satisfied and validate the results of the sponsoring agency's assessment of project performance.
- Compliance with SDLC requirements, the State's IT Master Plan, the agency's IT Master Plan and applicable technology standards and guidelines to ensure strategic alignment and technical sufficiency.
- Project funding and expenditure plans.

Should situations occur when project risk mitigation strategies have not succeeded in preventing or correcting project deficiencies, the State CIO will suspend funding pursuant to State Finance and Procurement Article 3-410.1, and through the Major Information Technology Development Project Fund (MITDPF) until remedies have been identified and implemented. For those projects not funded through the MITDPF, the State CIO will request the DBM Secretary to exercise existing budget controls to suspend funding until such remedies have been identified and implemented. Remedies may include requiring the sponsoring agency to redefine the project management plan, reassess the cost or benefits of the project, replace project team personnel or any other actions deemed appropriate by the State CIO to mitigate project risk.

DBM will utilize internal staff to validate project performance in terms of schedule, planned versus budgeted expenses, cost projections, end user feedback, reviewing and validating the Risk Management Plan, reviewing agency internal self assessments, contract management and actual expenses.

Peer Review

The third layer of oversight takes advantage of the significant amount of IT project management expertise residing in the agencies. Through Peer Review, project management experts from executive branch agencies will assess compliance with established processes, standards and project requirements, and suggest project management changes to both the sponsoring agency and to the State CIO. The Peer Review process will also be utilized to convey lessons learned to DBM and the agencies, and as part of a continuous improvement process, offer suggested changes to established processes.

Peer Review will be employed for all major IT projects regardless of the risk profile associated with the project. Based on the project assessment schedule defined by DBM, Peer Review will assess compliance and performance following the system concept phase of the SDLC, during the planning and requirements analysis phases, and periodically during the development, implementation and test phases.

Independent Verification and Validation

The final layer of project assessment is a third party Independent Verification and Validation (IV&V) of project performance. An IV&V may not be required for all IT projects. An IV&V may be utilized whenever deemed necessary by the sponsoring agency or the State CIO to satisfy stakeholder concerns or responsibilities, when a significant project milestone has not been achieved, or when a project exhibits a potential for failure. The scope of the assessment may be all-inclusive or may focus on obtaining an objective or specialized opinion concerning a particular aspect of the project.

All deliverables resulting from any IV&V will be made available to the State CIO. When an IV&V is required to assess an actual or perceived project management failure, the IV&V contractor will be responsible to the State CIO regardless of the funding source used to obtain the service or the contracting organization.

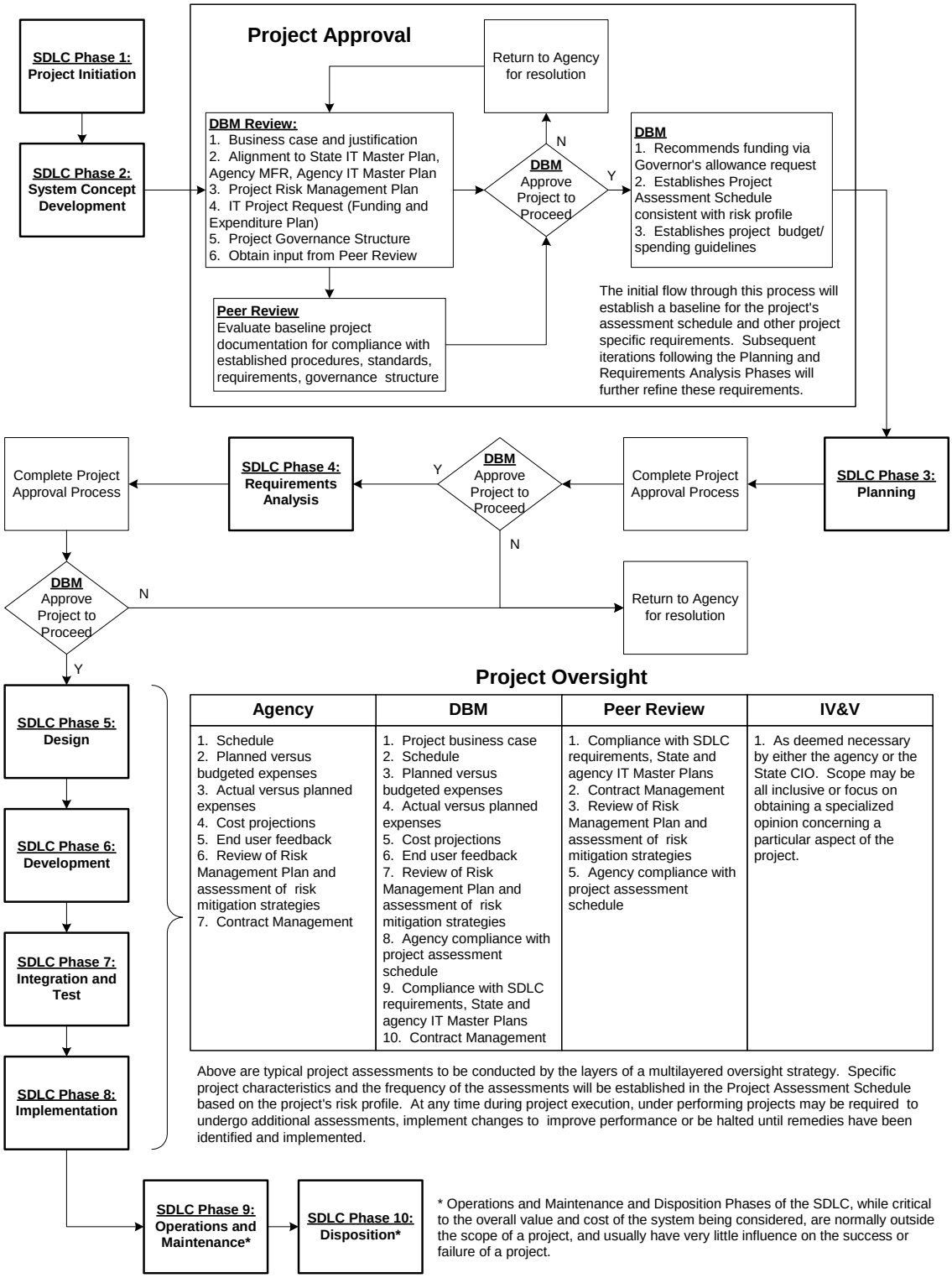
Implementation

Many aspects of this oversight blueprint have already been incorporated into the existing processes and policies that govern the approval, funding and management of major IT projects. Through a continuous improvement process, DBM is committed to periodically review these processes and policies to ensure a continued alignment with best practices for project management. Specifically, the SDLC will be reviewed and revised based on the lessons learned since its incorporation for governing project execution and include the tools for project managers and others to effectively assess project performance.

In addition, the effectiveness of other processes that influence Major IT project success such as Managing For Results (MFR), State Information Technology Master Plan (ITMP), and the Information Technology Project Request (ITPR) will be evaluated. Each process will be analyzed to determine how compliance or a lack of compliance with a particular process influences the outcome of a major IT project. Those processes, and specifically those procedural steps within each process, that if ignored or partially compliant would result in increased project risk, will be identified and an assessment methodology developed and implemented.

Finally, DBM will develop and conduct a training program for DBM and agency staff involved in executing, sponsoring or assessing major IT projects. Training will focus on the roles and responsibilities for each group of staff and how their actions influence project success.

Attachment A
Typical Project Oversight



Project Oversight

Agency	DBM	Peer Review	IV&V
1. Schedule 2. Planned versus budgeted expenses 3. Actual versus planned expenses 4. Cost projections 5. End user feedback 6. Review of Risk Management Plan and assessment of risk mitigation strategies 7. Contract Management	1. Project business case 2. Schedule 3. Planned versus budgeted expenses 4. Actual versus planned expenses 5. Cost projections 6. End user feedback 7. Review of Risk Management Plan and assessment of risk mitigation strategies 8. Agency compliance with project assessment schedule 9. Compliance with SDLC requirements, State and agency IT Master Plans 10. Contract Management	1. Compliance with SDLC requirements, State and agency IT Master Plans 2. Contract Management 3. Review of Risk Management Plan and assessment of risk mitigation strategies 5. Agency compliance with project assessment schedule	1. As deemed necessary by either the agency or the State CIO. Scope may be all inclusive or focus on obtaining a specialized opinion concerning a particular aspect of the project.

Above are typical project assessments to be conducted by the layers of a multilayered oversight strategy. Specific project characteristics and the frequency of the assessments will be established in the Project Assessment Schedule based on the project's risk profile. At any time during project execution, under performing projects may be required to undergo additional assessments, implement changes to improve performance or be halted until remedies have been identified and implemented.

* Operations and Maintenance and Disposition Phases of the SDLC, while critical to the overall value and cost of the system being considered, are normally outside the scope of a project, and usually have very little influence on the success or failure of a project.